REMARKS

Upon entry of the present amendment, claims 1-12 and 17-28 are pending in the application.

Claim 10 has been amended, as supported by the original claim itself. Applicants respectfully request reconsideration in view of the following remarks. No new matter has been introduced by the foregoing amendment.

Applicants are not conceding in this application that the amended claim would not have been patentable without the current amendments. The present claim amendment is intended only to facilitate expeditious allowance of valuable subject matter. Applicants respectfully reserve the right to present and prosecute the original versions of an amended claim in one or more continuing applications.

Reconsideration is respectfully requested in view of the foregoing amendment and the following remarks.

1. **Rejection of claims 1-12, 17-18, 20-23 under 35 U.S.C. §103(a), as allegedly unpatentable over Nienhaus et al. (WO 02/31071 using US 6,903,145 as the English translation), in view of Ohrbom et al. (EP 0 915 113).**

The Office Action (on page 2, third full paragraph) states that Nienhaus et al. (hereafter "Neinhaus") teaches a multicomponent system comprising (A) at least one component comprising at least two isocyanate-reactive functional groups, (B) one component containing a polyisocyanate, and (C) a component comprising at least two constituents which are curable with actinic radiation. The Office Action further states that preferred compounds are, for component A, meth(acrylate) copolymers containing hydroxy groups and, for component C, dipentaerythritol pentaacrylate. Additionally, the Office Action states that the composition may further comprise amino resin crosslinking agents such as those taught in "Carbamylmethylated Melamines," mentioned in column 5, lines 20-35 of Neinhaus. The Office Action notes that the amino resin crosslinking agents are the same as referenced in the instant application and are, therefore, assumed to meet all of the claimed limitations.

The Office Action concedes (page 2, last paragraph) that Neinhaus doc not teach a component comprising at least two allophanate or carbamate groups.

Ohrbom et al. (hereafter "Ohrbom") is, therefore, cited for teaching a dual cure system comprising a compound having a hydroxyl functionality and carbamate functionality, either in separate polymers or the same polymer, and an aminoplast crosslinker.

The Office Action alleges that it would have been obvious to have used compounds having carbamate functionality, as taught by Ohrbom, in the invention of Neinhaus, in order to provide rheology control and environmental etch resistance in systems curing also through crosslinking of hydroxy groups with polyisocyanate crosslinkers, as disclosed in Ohrbom in col. 2, lines 5-10. 10/02/2008 Office Action page 3, first paragraph.

The rejection is respectfully but strenuously traversed.

To briefly recap, the present invention is directed to a multicomponent system comprising, in a first component, (A) at least one oligomer, polymer, or combination thereof, comprising on average at least two allophanate groups, carbamate groups or at least one carbamate group and at least one allophanate group, and (B) at least one oligomer, polymer, or combination thereof, comprising on average at least two isocyanate-reactive functional groups, (C) at least one partly or fully alkylated amino resin comprising N-methylol ether groups or N- methylol and N-methylol ether groups, and (D) at least one compound comprising on average at least two groups which can be activated with actinic radiation, selected from the group consisting of pentaerythritol tetraacrylate, dipentaerythritol pentaacrylate, aliphatic urethane acrylates having six acrylate groups in the molecule, and a combination thereof. The second component of the multicomponent system comprises a polyisocyanate.

Such multicomponent systems can be cured thermally and with actinic radiation. As demonstrated in Example 1, pages 44-46, of the present application, such a triple cure mixture has an advantageously long processing time or pot life and is easy to apply. As demonstrated in Example 2, on pages 46-49, the triple-cure mixture in Example 1, when used as a clearcoat material to produce a multicoat color paint system, exhibits after curing thermally and by UV

radiation, particularly good leveling, a gloss of 76.6, very high scratch resistance, and very good wetting and intercoat adhesion. Furthermore, the clearcoat exhibits condensation resistance (page 48, lines 11-18), desirable hardness (page 48, lines 20-24), and favorable chemical resistance (page 48, line 26, to page 49, line 2).

The primary reference to Nienhaus also discloses a multicomponent system curable thermally and by actinic radiation. However, Nienhaus does not teach the present invention. Rather than a two-component system, Nienhaus uses a three-component system, in which components A, B, and C are mixed shortly before use. (See Abstract of Nienhaus.)

The Examiner has apparently used an analysis in which component A of Nienhaus is compared to component I-B of the present invention; component C of Nienhaus (even though in a different component of the multicomponent system) is compared to component I-D of the present invention, and component B of Nienhaus is compared to component II of the present invention.

This analysis, however, still leaves out component I-C of the present invention, namely a partly or fully alklylated amino resin comprising N-methylol ether groups or N-methylol and N-methylol ether groups, as well as component I-A, namely the oligomer or polymer comprising allophanate or carbamate groups.

The Office Action points to col. 5, lines 20-35, of Nienhaus for mentioning an amino resin. The Applicants are not contending that amino resin crosslinking agents referenced in Nienhaus cannot include the amino resin crosslinking agents per se used in the present invention. Rather, Applicants are pointing out that Nienhaus uses the amino resin crosslinking agent for a different purpose in a different combination in a different type of system, which given the bare mention of an amino resin crosslinking agent in Nienhaus does not justify its use for a completely different purpose, involving very different chemistry, reacting with different kinds of components, in a radically different system, especially when dealing with complicated systems of reactions that are unpredictable without actual testing.

In particular, with respect to the possible use of an amino resin crosslinking agent, Nienhaus states, "component (A) of the multicomponent systems may further comprise customary

and known additives in effective amounts. The essential factor is that they do not inhibit or prevent entirely the dual-cure crosslinking reactions." [Emphasis added.] (See col. 4, lines 39-42, of Nienhaus.) In this vein, Nienhaus mentions an extremely large list of possible additives, of which amino resin crosslinking agents are merely one, which list extends from col. 4, line 44, through all of col. 5, and then through col. 6, line 28. In particular, in col. 5, lines 21-45, Nienhaus states:

> Examples of suitable additional crosslinking agents as used in one-component systems are amino resins…resins or compounds containing epoxides…blocked isocyanates…and/or tris(alkoxycarbonylamino)triazines.

None of the examples in Nienhaus use an amino resin. Nowhere does Nienhaus teach reacting an amino resin with an oligomer or polymer comprising allophanate or carbamate groups, as required by the presently claimed invention. Clearly, since there are no such groups in the composition of Nienhaus, Nienhaus is teaching a different use for the amino resin, possibly for reaction with the polyisocyanate in component B, although Nienhaus does not go so far as to say whether the amino resin is added to component A, B, or C, or what it is to react with other than saying it should not entirely inhibit or prevent the dual cure crosslinking reactions. Furthermore, the fact that Nienhaus mentions that the amino crosslinking agents are "as used in one-component systems" suggests that Nienhaus provides no specific instructions on how to use it in a three-component system. In summary, Nienhaus does not teach the use of an amino resin for reaction with a carbamate or allophanate-containing oligomer or polymer. Accordingly, Nienhaus cannot possibly teach or suggest the use of an amino resin such that the equivalents ratio of allophanate groups and carbamate groups in the oligomer and polymer (A) to the N-methylol and N-methylol ether groups in the amino resin (C) is from 0.2:1 to 1:0.2, as required by claim 1 of the present invention.

Furthermore, as noted above, Nienhaus teaches a dual cure system in a three-component system, whereas the Applicant teaches a triple cure system in a two-component system. There is no reasonable motivation that the Examiner has supplied for such a radical and unpredictable modification of Nienhaus to obtain Applicants' invention, each involving a different complicated chemical reaction system in which changes to the system would produce unpredictable effects, as

would be appreciated by one of ordinary skill in the art not using hindsight based on Applicants' own disclosure. The purpose of the dual cure multicomponent system of Nienhaus is to improve flash-off time, which is too long, and initial hardness, even in the problematic shadow zones of three-dimensional substrates of complex shapes. Thus, the composition of Nienhaus is not designed to provide the advantages of the present invention, including a long pot life for the system, which nowhere is mentioned in Nienhaus.

Ohrbom cannot correct the deficiencies of Nienhaus. Ohrbom discloses a curable coating composition having a compound having carbamate functionality, a compound having hydroxy functionality, a polyisocyanate crosslinking agent, and an aminoplast crosslinking agent. Ohrbom, however, does not disclose a multicomponent system or a triple-cure system. Furthermore, Ohrbom does not teach a system that is curable by radiation or that comprises a compound selected from the group consisting of pentaerythritol tetraacrylate, dipentaerythritol pentaacrylate, aliphatic urethane acrylates having six acrylate groups in the molecule, and a combination thereof. Hence, Ohrbom alone cannot possibly teach the present invention.

Furthermore, as indicated above, the Office Action has conceded that Nienhaus does not teach the use of at least one oligomer, polymer, or combination thereof, comprising on average at least two allophanate groups, carbamate groups, or at least one carbamate group and at least one allophanate group. The Office Action alleges, however, that it would have been obvious to have used compounds having carbamate functionality, as taught by Ohrbom, in the invention of Nienhaus, in order to provide rheology control and environmental etch resistance in systems curing also through crosslinking of hydroxy groups with polyisocyanate crosslinkers, as disclosed in Ohrbom in col. 2, lines 5-10.

It is respectfully submitted, however, that the motivation suggested by the Office is ill-founded. Ohrbom actually states, on page 2, lines 17-31, as follows:

> ...a coating must be formulated to minimize the amount of regulated volatile organic compound emissions from the painting process. For a thermoset solventborne system this is usually accomplished by employing low molecular weight resins and crosslinking agents. One drawback to this approach is that such coating systems have poorer rheological properties during application and the curing bake. When the coatings are heated in order to cause a reaction...the viscosity of the low molecular weight resins is

> reduced. These resins tend to flow on the coated substrate causing sagging, slumping, so-called fat edges, and other appearance problems before the coating has achieved a sufficient level of cure to prevent further movement. Difficulties with controlling rheology have been a problem particularly with coatings that are cured using blocked polyisocyanates as crosslinkers....such systems must usually be heated to temperatures of 290°F (143°C) and higher to de-block the polyisocyanate and thereby initiate cure....Thus, the coating composition flows more than is desirable before there is sufficient crosslinking to set up the coating film.

Thus, based on the above-quoted excerpt, it is evident that Ohrbom is really concerned with thermally cured single-component systems involving blocked polyisocyanates heated at high temperatures (143°C and higher). Nienhaus, like the present invention, involves multicomponent systems that do not involve blocked polyisocyanates or involve polyisocyanates present in minor amounts, as stated in present claim 17, since the polycyanates are in a separate component from the isocyanate-reactive oligomer or polymer. Consequently, lower temperature can be used (80°C for only 10 minutes in the present examples and 60°C for 15 minutes in Nienhaus (col. 16, lines3-8), as compared to143°C for 15 minutes (paragraph [0072] in Ohrbom). It is clear, therefore, that the rationale used for combining Ohrbom with Nienhaus is based on false assumptions, namely the use of high temperature curing of single-component compositions containing blocked isocyanates, which is contrary to the teachings of both Nienhaus and the present invention. Thus, the rejection in the Office Action is mixing "apples and oranges" contrary to the teachings in the prior art.

Furthermore, since Nienhaus is directed to a multicomponent system using UV radiation for curing and Ohrbom is directed to a single-component composition using only thermal cure, it would be entirely unpredictable as to the effect of combining the components of Ohrbom with the components of Nienhaus. It would not be clear whether, for example, the different reactions would proceed as desired, especially since the amino resin can react with either a carbamate or a hydroxyl group. Nor would the effect of the third cure component C in Nienhaus on the reactions in Ohrbom be predictable. Clearly the high temperature curing of Ohrbom is not consistent with the relatively low temperature curing of Nienhaus.

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a *prima facie* case of obviousness. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir.

1988). The Supreme Court has recently reaffirmed the principle that "a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the art". *KSR Int'l. Co. v. Teleflex Inc.,* 127 S.Ct. 1727, 1741 (2007). Furthermore, while the KSR decision may have eliminated any rigid requirement for application of the teaching-suggestion-motivation test (TSM test), it did not disturb the longstanding principle that "a prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984)." MPEP 2141.02.

Regarding claim 10, the Office Action concedes that Neinhaus does not teach allophanate groups reactive, but adds that falls within the claimed range of up to 30%. 10/02/2008 Office Action page 3, last paragraph. Applicants have amended claim 10 to clarify that allophanate groups are present.

Regarding claims 17, 18, 20, 21, 22, 23, and 25-26, these claims, by themselves, relate to secondary or isolated features of the present invention and they are patentable as a whole at least because they depend from claim 1, for the reasons stated above.

2. Rejection of claims 19, 24, and 27-28 under 35 U.S.C. §103(a), as allegedly unpatentable over Nienhaus et al. (WO 02/31071 using US 6,903,145 as the English translation), in view of Ohrbom et al. (EP 0 915 113), as applied to claims 1-12, 17-18, 20-23 above, and further in view of Blum et al. (WO 02/02704 using US 6,803,393 as the English translation).

Regarding claims 19, 24 and 27-28, the Office Action states that Neinhaus teaches the basic composition as set forth earlier in the Office Action, but concedes (page 5, second paragraph of the Office Action) that Nienhaus does not teach the claimed weight percentages or weight ratios other than for the polyisocyanate-containing component of the system. The Office Action states, however, that Blum et al. (hereafter "Blum") teaches multicomponent systems comprising 1 to 50% by weight isocyanate reactive polymers having actinic groups (A3); 1 to 50% by weight isocyanate reactive polymer/oligomers (A2); 1 to 60% by weight actinic group containing compound (A1); and 1 to 50% by weight of amino resin and isocyanate crosslinking

agents. The Office Action states that it would have been obvious to use the weight percentages taught by Blum in Neinhaus in order to effectively crosslink the composition.

This rejection is respectfully traversed. In addition to the reasons stated above with respect to Nienhaus, Blum cannot correct the deficiencies of Neinhaus. In particular, Blum teaches that the binder (A1), which comprise groups that can be activated with actinic radiation, are polyesters whose molecule contain 5 or 6 membered unsaturated rings of the formulae I, II, and/or III in Blum. (Blum, at column 2, lines 25-55.) Blum also teaches that radiation-active groups are attached to the parent structure of the binder (A3) by way of urethane, urea, allophanate, ester, ether and/or amide groups. (Blum, at column 7, lines 9-11.) Blum teaches that the binder that comprises isocyanate-reactive groups (A2) is modified to also include actinic radiation active groups to arrive at (A3) and does not teach or suggest the use of a separate non-polymeric compound (D) that is selected from the group consisting of pentaerythritol tetraacrylate, dipentaerythritol pentaacrylate, and aliphatic urethane acrylates having six acrylate groups in the molecule. Importantly, however, it is respectfully submitted that Blum does not teach multicomponent systems comprising a polymer/oligomer comprising allophanate or carbamate groups.

RESPONSE TO ARGUMENTS

The Office Action responds to Applicants' argument that Nienhaus teaches a different use for the amino resin mentioned in the specification by stating that "While they [amino resins] would behave differently in a system comprised solely of the invention of Neinhaus, versus one that incorporates the invention of Ohrbom, the skilled artisan would still know to incorporate alkylated melamine crosslinkers in the combined invention." 10/02/2008 Office Action page 6, paragraph 2.

Applicants respectfully submit, however, that the fact that Nienhaus teaches a different use of an amino resin means that one of ordinary skill in the art would not be able to remotely predict the result of combining the systems of Nienhaus and Ohrbom. The result of the combination would result in different reactions involving the amino resin of Nienhaus as well as the carbamate

of Ohrbom. This is not merely a matter of adding minor new features but critically changing major existing features in the reaction systems in each of the references.

Applicants pointed out that (1) Nienhaus teaches a three-component system, whereas the components are mixed such that there are only two components; (2) Nienhaus teaches a dual cure system in a three-component system, on page 11, first full paragraph; and (3) Ohrbom is directed to a thermally cured single-component system. The Office Action responds by stating that while both Nienhaus and Ohrbom "are not multicomponent systems, they are still similar enough that the ordinary artisan could easily have looked to Ohrbom to incorporate a secondary cure method." 10/02/2008 Office Action page 6, paragraph 3. Again, Applicants maintain that the present invention involves a complicated set of simultaneous chemical reactions, while Nienhaus and Ohrbom are so dissimilar that the modifications to each necessary to obtain the present invention, as proposed in the Office Action, are not only extremely lacking in support, but not remotely predictable.

The Office Action states that Ohrbom gives motivation to combine Ohrbom with Nienhaus "namely in order to provide rheology control and environmental etch resistance in systems curing through crosslinking of hydroxyl groups and polyisocyanate crosslinkers," citing page 2, lines 5-10 of Ohrbom. This was apparently in response to Applicants' pointing out that the Supreme Court has stated that "it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does," *KSR Int'l. Co. v. Teleflex Inc.,* 127 S.Ct. 1727, 1741 (2007).

Applicants submit, however, that the modifications proposed in the Office Action, involving changes to complicated chemical reactions, would have far greater and multitudinous effects than mere rheology changes. One of ordinary skill in the art not have even envisioned such modifications nor would one have been motivated to make such major changes merely to attempt some possible modification of rheology, especially since other means of modifying rheology would be much less drastic, such as merely adding a conventional thickener. In any case, the total result of such a proposed change would be completely unpredictable in the absence of actual

experimental testing. Likewise, the effect of the proposed combination on environmental etch resistance would be highly unpredictable.

Furthermore, the reliance on Ohrbom's statement, on page 2, lines 5-10, that "rheology control and environmental etch resistance" can be improved is incomplete. Ohrbom actually states that the "present invention relates" to "thermoset coating compositions…to provide rheology control and environmental etch resistance…." As discussed above, Nienhaus is directed to a multicomponent system using UV radiation for curing, whereas Ohrbom is directed to a single-component composition using only thermal cure. Hence, the alleged motivation was quoted out of context in the Office Action.

The Examiner further states that the unexpected results pointed out by the Applicants would be inherent in the multicomponent system taught by Nienhaus in view of Ohrbom. However, the courts have repeatedly stated that inherency is not relevant to obviousness as compared to anticipation.

Finally, the Office Action states that the components of Blum "are close enough to constitute a teaching of the general ratios that the skilled artisan would use, in response to Applicants' position that, since the percentages in Blum refer to a different component than required by the claims, the percentages are of very limited or no relevance." The Office Action concedes that component A2 of Blum does not have reactive carbamate groups and component A2 does not have methacrylate groups, but that Blum does teach a component A3 having actinic groups, a compound A2 having isocyanate reactive functionality, an amino resin, and a compound A1 having actinic groups. Applicants submit, however, that leaving out a critical component of a reaction system, such as a carbamate-functional polymer, would correspondingly change the relevant amounts of the other components. Moreover, the ranges cited in Blum are very broad, compared to the more specific ranges of each component required in Claims 19 and 27, which produces the superior results discussed above.

CONCLUSION

Applicant(s) respectfully submit that the Application and pending claims are patentable in view of the foregoing amendments and/or remarks. A Notice of Allowance is respectfully requested. As always, the Examiner is encouraged to contact the Undersigned by telephone if direct conversation would be helpful.

Respectfully Submitted,

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